CALIFORNIA DEPARTMENT OF HEALTH SERVICES
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

September 2004

Technical Report No. 04-23

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of September 2004. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium distribution and relative abundance decreased at most locations compared to the previous month. This

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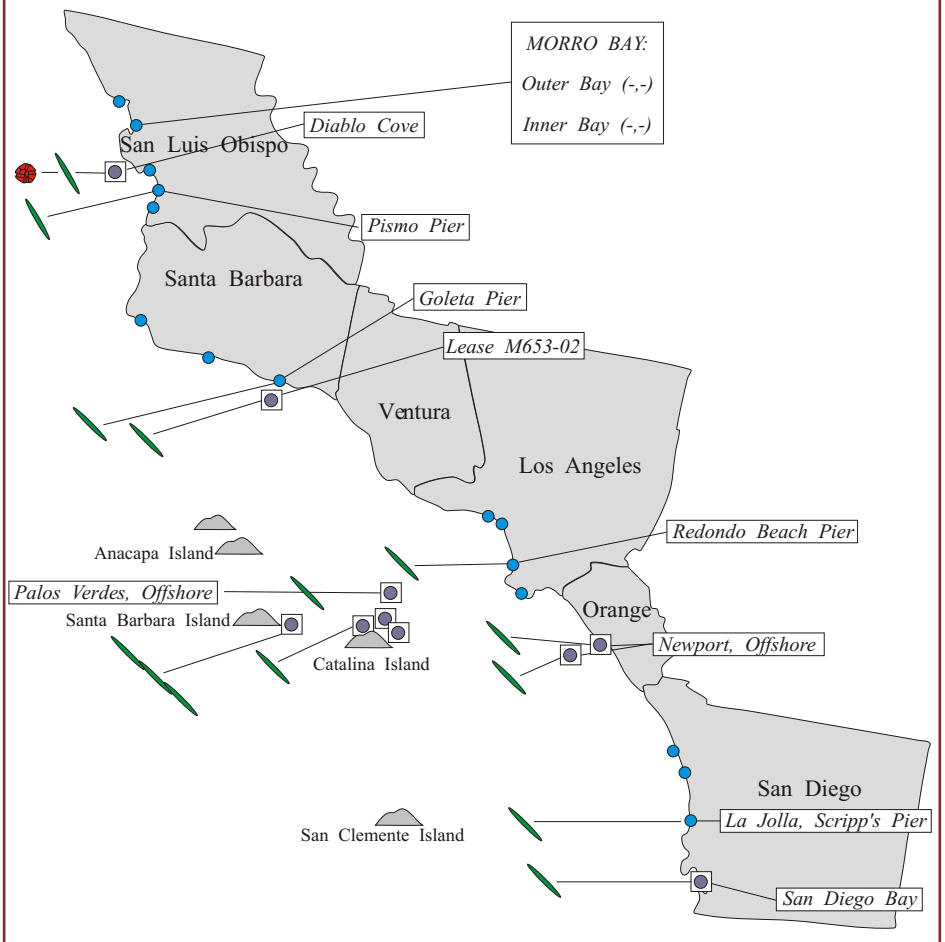
Figure 1. Distribution of toxin-producing phytoplankton in Southern California during September, 2004.



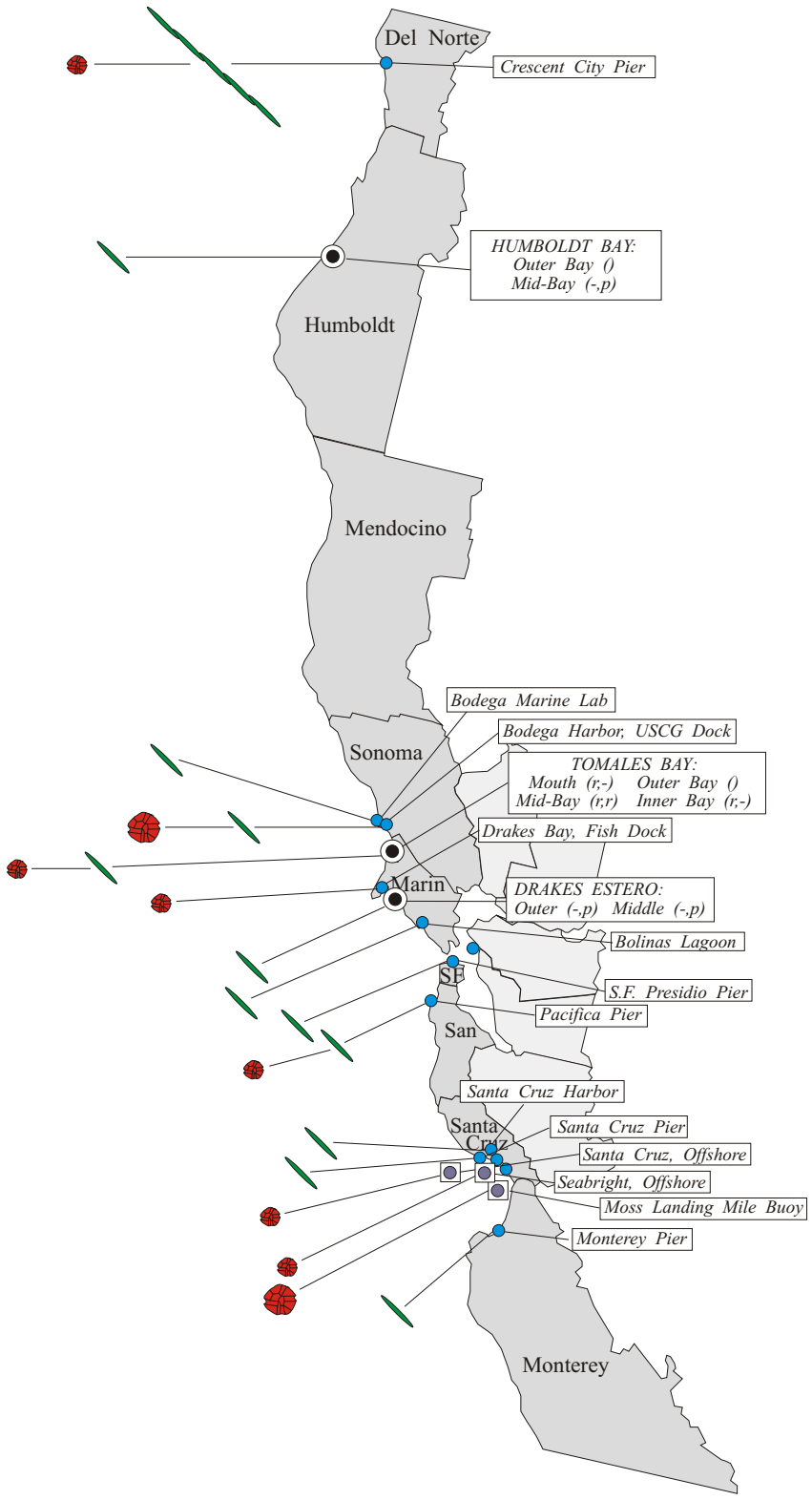
Relative Abundance of Known Toxin Producers

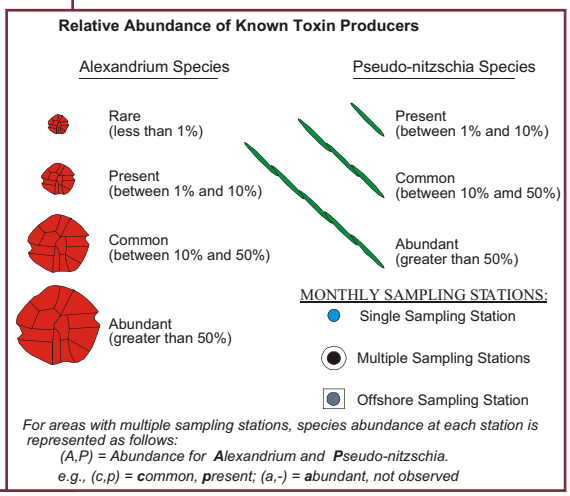
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
Abundant (greater than 50%)	

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

MONTHLY SAMPLING STATIONS:
- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during September, 2004.





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dinoflagellate was only observed offshore of Diablo Canyon (San Luis Obispo County) (Figure 1).

Low concentrations of PSP toxins continued to be detected inside Morro Bay through the first week of September and in northern Santa Barbara County at Vandenberg throughout the month (Figure 3). A sample of rock scallop viscera from an offshore oil platform contained 73 ug of toxins.

Domoic Acid

Pseudo-nitzschia was observed along the entire Southern California coast in September (Figure 1). The relative abundance was lower than observed in August, particularly along the San Luis Obispo coast. The highest relative abundance (10%) was observed offshore near Santa Barbara Island.

Non-toxic Species

The San Luis Obispo coast was dominated by a diversity of dinoflagellate species (*Prorocentrum*, *Ceratium*) with some diatom species common as well (*Coscinodiscus*, *Chaetoceros*). The dinoflagellate *Cochlodinium* continued to be abundant inside Morro Bay and at Pismo Pier through the first two weeks of September. By the end of the month a *Gymnodinium sanguineum*

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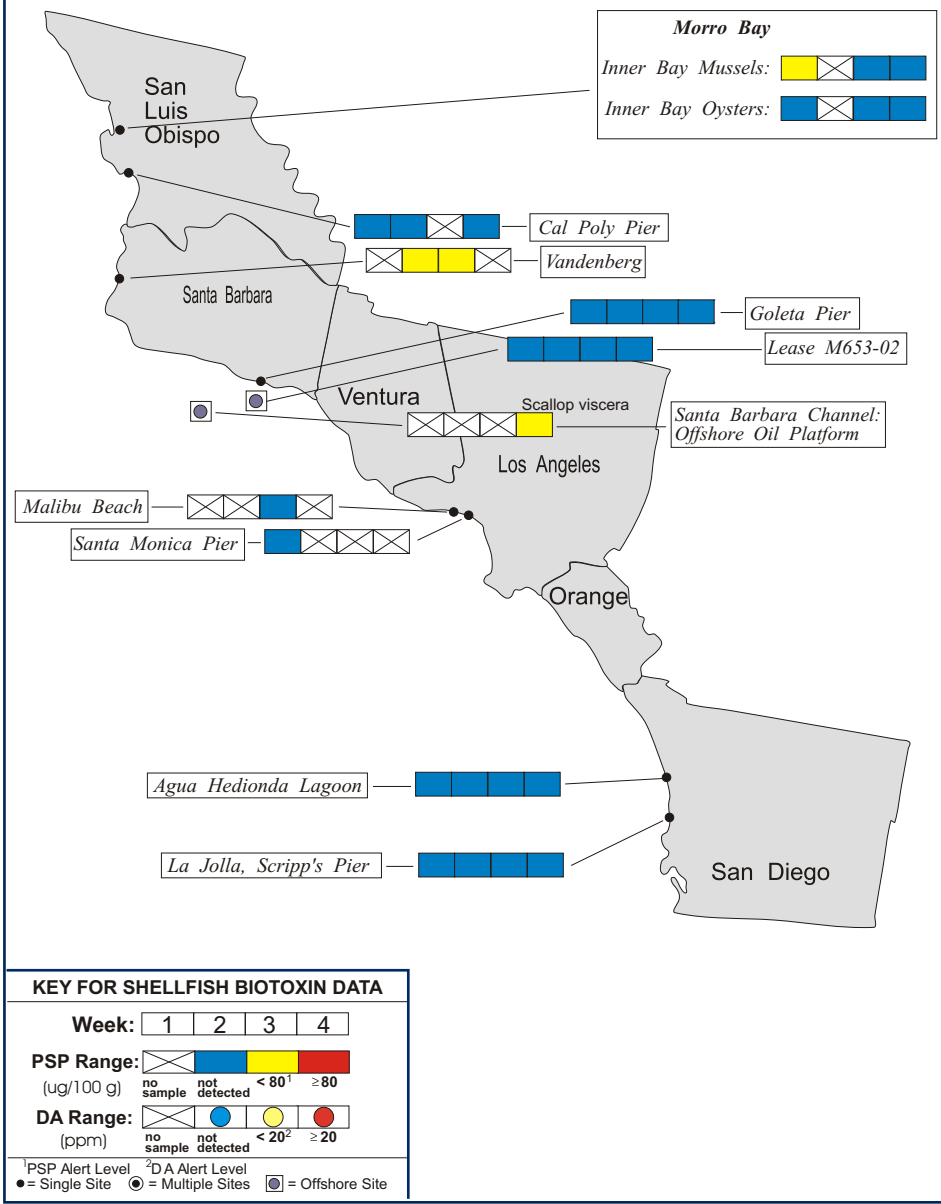
Figure 3. Distribution of shellfish biotoxins in Southern California during September, 2004.



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bloom had taken over at Pismo.

Santa Barbara contained a diverse mix of dinoflagellates (*Ceratium*, *Prorocentrum*, *Gymnodinium*, and *Lingulodinium*) and diatoms (*Hemialus*, *Bacteriastrum,* and *Chaetoceros*). *Hemialus* was abundant offshore near Santa Barbara Island and Catalina Island. This diatom was also common from Los Angeles through San Diego County, although *Bacteriastrum* was more abundant at some sites in this region. Numerous dinoflagellate species were also common, including *Lingulodinium polyedrum*, *Ceratium furca*, and *Prorocentrum micans*. *Dinophysis caudata*, a dinoflagellate linked to the production of diarrhetic shellfish poisoning toxins (DSP), was common offshore of Orange County.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed along most of the Northern California coastline in September (Figure 2). The relative abundance was similar to August's observations, with slight increases at some sites and decreases at others. The highest relative abundance of this dinoflagellate was observed at the U.S. Coast Guard dock in Bodega Harbor and in Monterey Bay at

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

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the Moss Landing mile buoy.

PSP toxins were only detected at two locations along the Northern California coast in September (Figure 4). Low concentrations of these toxins were detected in outer Humboldt Bay and in Drakes Estero during the last week of the month.

Domoic Acid

Pseudo-nitzschia was observed along most of the Northern California coast in September (Figure 2). The relative abundance decreased at most locations compared to observations in August, with the exception of a significant increase in Crescent City (Del Norte County) by the second week of the month.

Non-toxic Species

Diatoms dominated the northernmost coast, particularly *Skeletonema*, *Coscinodiscus*, *Chaetoceros*, *Thalassiosira*, and *Melosira*. Dinoflagellates were more common from Marin to Monterey, with *Gymnodinium sanguineum*, *Ceratium spp.*, and *Prorocentrum micans* among the most abundant. *Cochlodinium*, a dinoflagellate that caused noxious red tides inside Monterey Bay in past months, remained common along the Santa Cruz coast and offshore at the Moss Landing mile buoy.

Figure 4. Distribution of shellfish biotoxins in Northern California during September, 2004.

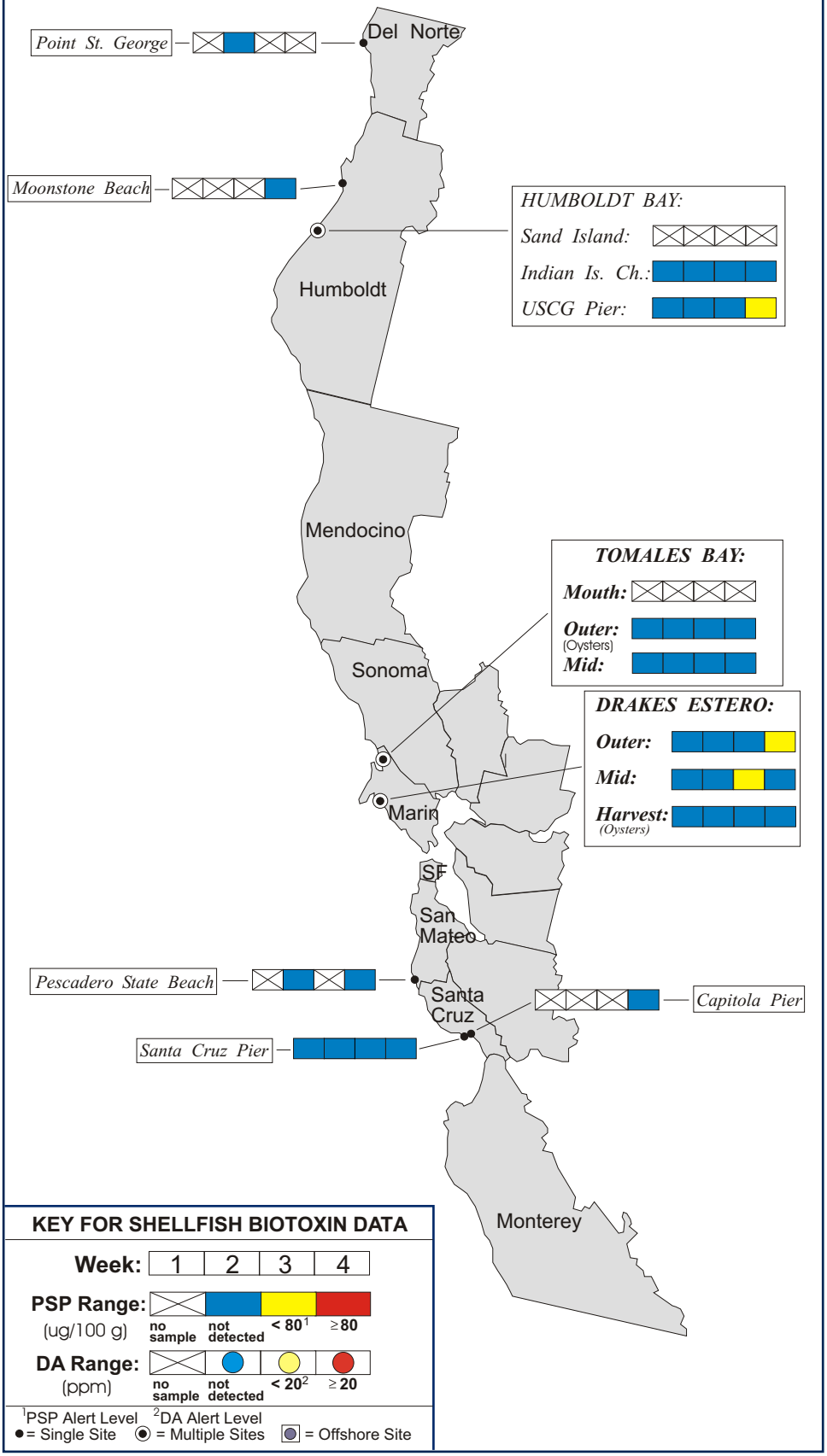


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during September, 2004.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	4
	Hog Island Oyster Company	4
	Johnson Oyster Company	16
	Marin Oyster Company	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	6
	U.C. Santa Barbara Marine Science Institute	3
Santa Barbara	Santa Barbara Mariculture Company	9
	U.C. Santa Barbara Marine Science Institute	5
	Vandenberg Air Force Base	2
	DHS Volunteer (Bill Weinerth)	1
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	1
	Los Angeles Regional Water Quality Control Board	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	5

QUARANTINES:

The health advisory issued by the State Health Director on June 10 remained in effect. This advisory warned consumers to avoid eating sport-harvested shellfish from Humboldt and Del Norte counties and was the result of dangerous levels of domoic acid in razor clams collected from this region. The increase in relative abundance of *Pseudo-nitzschia* in September reinforced the continued need for the advisory and for continued monitoring. Unfortunately adequate low tides for sampling razor clams did not occur in September.

The annual quarantine on the sport-harvesting of mussels went into effect on April 23, one week ahead of the normal May 1 start date. This action was taken as a result of elevated levels of domoic acid in Santa Cruz County and, subsequently, along the Santa Barbara coast.

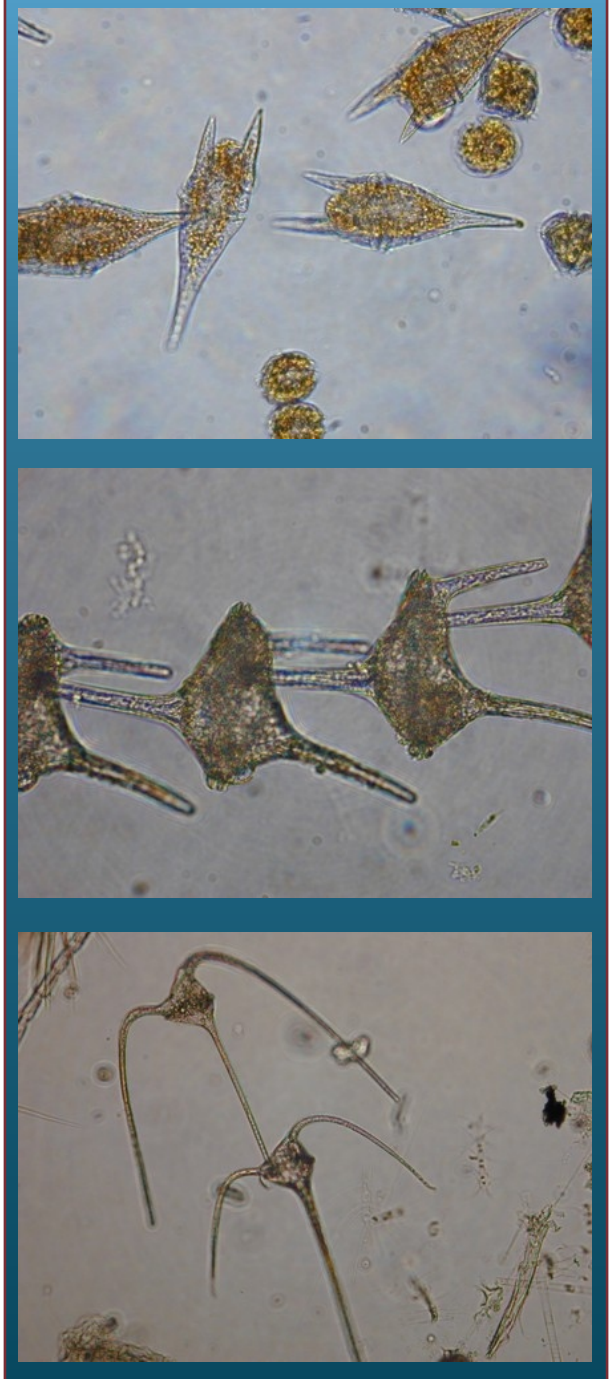
The annual mussel quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. This quarantine does not affect the commercial shellfish growing areas in California. All commercial shellfish growers certified by the State of California are required to submit routine samples for biotoxin analysis, allowing us to closely monitor for the occurrence of any toxin. Harvesting closures are imposed if toxin levels reach the federal alert level.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Persons taking any clams or scallops are advised to remove and discard the dark parts (i.e., the digestive organs or viscera).

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during September, 2004.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	4
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	Bodega Marine Laboratory	1
	DHS Volunteer (Cathleen Cannon)	1
Marin	CDHS Volunteers (Brent Anderson, Richard Plant, Marjorie Siegal, Mary Von Tolksdorf)	12
	Johnson Oyster Company	8
Contra Costa	DHS Marine Biotoxin Monitoring Program	2
San Francisco	CDHS Volunteer (Eugenia Mcnaughton)	4
San Mateo	San Mateo County Environmental Health Department	2
	CDHS Volunteer (Sandy Emerson)	1
Santa Cruz	Santa Cruz Environmental Health Department	3
	U.C Santa Cruz	3
	Pacific Cetacean Group	1
	California Department of Parks and Recreation	1
	San Lorenzo Valley High School	2
Monterey	CDHS Volunteer (Jerry Norton)	1
	Pacific Cetacean Group	3
San Luis Obispo	CDHS Volunteers (Renee and Auburn Atkins)	4
	Morro Bay National Estuary Program	4
	Tenera Environmental	2
	U.C. Santa Barbara Marine Science Institute	2
	Morro Bay Natural History Museum	1
Santa Barbara	U.C. Santa Barbara Marine Science Institute	7
	Santa Barbara Mariculture Company	4
	Vanderberg Air Force Base	2
	Guided Discoveries (CTSE)	1
	California Department of Parks and Recreation	2
Ventura	None Submitted	
Los Angeles	Guided Discoveries (CTSE)	6
	Catalina Island Marine Institute	1
	Los Angeles County Sanitation District	4
	Los Angeles County Health Department	1
	CDHS Volunteer (Richard Weaver)	1
	Los Angeles Regional Water Quality Control Board	1
Orange	Orange County Sanitation District	6
San Diego	CDHS Volunteer (Paul Sims, Jeff Kermode)	5
	Scripps Institute of Oceanography	5

PHYTOPLANKTON GALLERY



Various species of the dinoflagellate Ceratium are featured in these pictures. A common genus along the California coast, Ceratium is not a toxin producer but can occasionally cause red tides. C. furca, shown in the first photo (along with a few cells of Alexandrium, the PSP toxin producer), is the most common species observed.